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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PECHHOLD, ALEXANDRA K	
ART UNIT	PAPER NUMBER

3671

DATE MAILED: 12/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/308,962

Applicant(s)

CANTERI, CARLO

Examiner

Alexandra K Pechhold

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 15, 18, 19, 21, 25, and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by article in *Modulo*, No. 206, page 1128 (dated 11/94) entitled “Recovery of Settlements” (hereinafter referenced as *Modulo*).**

Regarding claims 15, 18, and 30, *Modulo* discloses a technique of injecting expanding resins under pressure into holes in the foundation under structures, to enhance lifting and carry out consolidation. The method is laser controlled (see Figure). *Modulo* notes that expansion may reach a value of to 10-20 times the volume of the injected product, clearly reinforcing the area. *Modulo* notes that a very high accuracy of the lifting can be achieved thanks to advanced laser level control (see English translation).

Regarding claims 19 and 31, the figure in *Modulo* illustrates a hole that appears vertical, and notes in the English translation that the injected resins penetrate all the present voids and fractures filling them up.

Regarding claim 21, *Modulo* states that immediately after injection the expansion process starts (see English translation).

Regarding claim 25, Modulo notes that the resins are injected until a lifting of about 1-2 mm of the overhanging structure is gauged. Therefore, achieving this amount of lifting may require repeated injections.

Regarding claims 29 and 32, Modulo notes that ground settlements can concern any building.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 16, 17, 20, 23, 24, 28, 33, 34, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Modulo*, No. 206, page 1128 (dated 11/94) entitled "Recovery of Settlements" (hereinafter referenced as *Modulo*).**

Regarding claims 16 and 17, Modulo discloses that injection holes, yet fails to disclose repeated the injection at different depth, and having the depth level spaced by 1m. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the step of injecting in Modulo to be at varying depths, since Modulo merely discloses a plurality of holes which are injected with resin to cause upward movement, and finding the appropriate depth and spacing would depend on the environmental conditions of the site. Furthermore, it has been held that discovering the

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optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 20, Modulo discloses repairing foundations, which can therefore be an entire thickness of soil layers.

Regarding claim 23, Modulo fails to disclose spacing between adjacent holes. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify holes of Modulo to be between 0.5-3m apart, since Modulo merely discloses a plurality of holes which are injected with resin to cause upward movement, and finding the appropriate spacing would depend on the environmental conditions of the site. Furthermore, it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 24, Modulo appears to depict a vertical hole in the figure, though it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the angle of the hole in Modulo to be at an angle with respect to the vertical, since finding the most effective access to the foundation may not always be from a vertical orientation.

Regarding claim 28, Modulo discloses injection holes having a diameter of about 15mm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the holes used in the method of Modulo to include tubes inside the holes having about a 10mm diameter, since Modulo discloses holes of about 15 mm in diameter which is can be considered about 10mm.

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Regarding claims 33, 36, and 37, Modulo discloses the method as disclosed in reference to claims 15 and 30 above. Modulo fails to disclose determining attainment of a minimum compaction value required. Yet Modulo discloses that thanks to an advances laser level control, a very high accuracy of the lifting can be achieved, further noting that injection occurs until a lifting of about 1-2 mm of the overhanging structure is gauged. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Modulo to include producing compaction until the soil compaction reaches levels which are higher than a minimum compaction value required, and determining that minimum compaction required, since Modulo states that thanks to an advances laser level control, a very high accuracy of the lifting can be achieved.

Regarding claim 34, Modulo notes that ground settlements can concern any building.

5. Claims 22, 26, 27, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Modulo*, No. 206, page 1128 (dated 11/94) entitled "Recovery of Settlements" (hereinafter referenced as *Modulo*) as applied to claims 15, 20, and 21 above, and further in view of Haekkinen (US 4,567,708).

Regarding claims 22 and 35, Modulo fails to disclose the material components comprising the expanding resin. Haekkinen teaches an expanded resin comprising a ready blended polyol mixture comprising a polyetherpolyol, catalysts, and water, combined with an MD isocyanate (Col 3, lines 14-20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the

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expandable resin used in the method of Modulo to comprise a mixture of polyether polyol and/or a polyester polyol, a catalyst and water, with isocyanate MDI as taught by Haekkinen, since Haekkinen states in column 2, lines 16-17 that the hardened foam serves as a support for the previously sunken portion and as a thermal insulation.

Regarding claim 26, Modulo fails to disclose if the expandable resin is heated before injection. Haekkinen teaches that apparatus (4) is connected to a hole, leading to a high pressure mixer in which the foam components are mixed (Col 3, lines 11-13), thereby inherently generating heat. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the expandable resin used in the method of Modulo to include the addition of heat before injection as taught by Haekkinen, since heating may provide advantageous properties to the expansion material, which Haekkinen notes in column 2, lines 16-17 serves as a support for the previously sunken portion and as a thermal insulation.

Regarding claim 27, Modulo fails to disclose water in the expandable resin, and does not disclose any material in the resin. Haekkinen teaches an expandable resin having water in column 3, lines 16, though fails to disclose the exact amount thereof. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the expandable resin used in the method of Modulo to comprise water as taught by Haekkinen, since Haekkinen states in column 2, lines 16-17 that the mixture of materials, which comprises water (Col 3, lines 14-16), serves as a support for the previously sunken portion and as a thermal insulation. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention

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was made to modify the amount of water used in the method of Haekkinen to be 3.44%, since it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Response to Arguments

6. Applicant's arguments with respect to Haekkinen (US 4,567,708) have been considered and are persuasive regarding the steps pertaining to compaction of the foundation soil and the specific potential increase in volume expansion.

Applicant's arguments with respect to the Modulo, No. 206, on the other hand, have also been considered but are not persuasive. Modulo does disclose a method so "that the ground below is able to support the overhanging loads and that the surround voids have been filled up." This certainly is evidence of applicant's claim of a method "for increasing the bearing capacity of foundation soils for built structures." Modulo discloses "injection holes", therefore discloses a *plurality*, and also discusses the method as it pertains to "the repair of foundations", therefore indicating substantial depths. Module also disclose that "expansion may reach a value up to 10 to 20 times the volume of the injected product", indicating significant expansion. Module also discloses that a compaction may occur, "By means of said technique it is possible to carry out a consolidation", as applicant admits on page 9 of response. Modulo notes that a very high accuracy of the lifting can be achieved thanks to advanced laser level control, therefore having the ability to constantly monitor level variations of the soil

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and/or buildings overlying the injection zone to detect when the buildings and/or soil surface begin to raise. With respect to applicant's arguments of the references having no disclosure of forming "tree-like shapes" along the columns, examiner refutes this argument. Modulo discloses that the injected resins "penetrate all the present voids and fractures, filling them up". Inherently, by the nature of soil and foundations, an expanding resin injected under pressure, when it begins to "penetrate all the present voids and fractures, filling them up", a tree-like shape will naturally occur.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Pechhold whose telephone number is (703) 305-0870. The examiner can normally be reached on Mon-Thurs. from 8:00am to 5:30pm and alternating Fridays from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas B. Will, can be reached on (703)308-3870. The fax phone number for this Group is (703) 305-3597.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1113.



Thomas B. Will
Supervisory Patent Examiner
Group 3600

AKP
12/4/02